Amendments to the Substitute Specification:

Please amend paragraph [0011] as follows:

[0011] For this reason, it has been attempted to use aerosol scattering with Doppler-displaced backscattering on air molecules, to achieve a sufficiently high measuring reliability for flight controls at all flight altitudes and under all weather conditions. For example, the article by D. Rees and I.S. McDermid, "*Doppler Lidar Atmospheric Wind Sensor; Reevaluation of a 355-nm Incoherent Doppler Lidar*", Appl. Opt., Vol. 29, No. 28, Pages 4133-4144 (1990) discusses the measurement of molecular Doppler displacement in Doppler-lidar systems by means of Fizeau or Fabry-Perot interferometers with an incoherent reception. During spectral measurement, the received photons are distributed by way of an interference pattern with an imaging locally resolving detector on several receiving channels (specifically, in the Fabry-Perot interferometer to concentric interference rings, and in the Fizeau interferometer, to interference strips). However, the ~~problems~~ problem exists here that the recognition of weak signals becomes difficult in comparison to the noise of several individual receiving channels.

Please amend paragraph [0027] as follows:

[0027] The invention also resolves the problem of the spectral broadening of the laser backscatter on molecules because of thrusts and thermal movement of the molecules. This broadening may be, for example, by a factor from 10 - 100 greater than the smallest ~~Dopier~~ Doppler frequency shift on atmospheric turbulence which is to be detected. This broadening of the reception signal to a greater spectral range had heretofore made it so difficult to detect the Doppler shift in the spectrally uniformly distributed noise that sufficiently precise measurements were not possible. By means of the invention, the Doppler shift can be determined in a precise manner despite the spectral broadening.

Please amend paragraph [0057] as follows:

[0057] The output of the photodetector 17 is electrically coupled to an analyzing unit 18 which comprises a memory 18a and a comparison unit 18b in the form of a microprocessor. One or more reference patterns for interferograms which apply to defined atmospheric and, if necessary, additional parameters, are stored in the memory 18a. The comparison unit [[17b]] 18b is used to compare the interferogram imaged on the photoreceiver 17 with the one or more reference patterns, and to determine the wind velocity from the comparison. For the adaptation, computation or alteration of the reference pattern, additional parameters can be fed to the comparison unit 18b as input data 22.

Please amend paragraph [0059] as follows:

[0059] Furthermore, the beam fed directly by the transmitting device is used to determine the transfer function of the optical reception system by means of its different components, such as the fiber 14, the filter 15 and the interferometer 16. In this case, the directly fed laser beam is fed to the interferometer 16, and the resulting interferogram is subsequently imaged on the photodetector 17.